Abstract Submitted to the
International Conference on Strongly Correlated Electron Systems
University of Michigan, Ann Arbor
August 6-10, 2001

Deviations from Matthiessen's Rule for $SrRuO_3$ and $CaRuO_3$*

L. Klein[1], Y. Kats[1], N. Wiser[1], M. Konczykowski[2], J. W. Reiner[3], T. H. Geballe[3], M. R. Beasley[3], A. Kapitulnik[3]

[1] *Department of Physics, Bar-Ilan University, Ramat-Gan 52900, Israel*
[2] *Laboratoire des Solides Irradies, Ecole Polytechnique, 91128 Palaiseau Cedex, France*
[3] *T. H. Geballe Laboratory for Advanced Materials, Stanford University, Stanford, California 94305*

We have measured the change in the resistivity of thin films of $SrRuO_3$ and $CaRuO_3$ upon introducing point defects by electron irradiation at low temperatures, and we find significant deviations from Matthiessen's rule. For a fixed irradiation dose, the induced change in resistivity **decreases** with increasing temperature. Moreover, for a fixed temperature, the increase in resistivity with irradiation is found to be **sublinear**. We suggest that the observed behavior is due to the marked anisotropic scattering of the electrons together with their relatively short mean free path (both characteristic of many metallic oxides including cuprates) which amplify effects related to the Pippard ineffectiveness condition.

*This research was supported by The Israel Science Foundation founded by the Israel Academy of Sciences and Humanities and by Grant No. 97-00428/1 from the United States-Israel Binational Science Foundation (BSF), Jerusalem, Israel.